What is claimed is:

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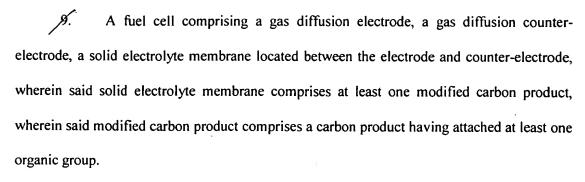
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- A fuel cell comprising a gas diffusion electrode, a gas diffusion counterelectrode, a solid electrolyte membrane located between the electrode and counter-electrode, wherein the electrode or the counter-electrode or both comprise at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.
- 2. The fuel cell of claim 1, wherein said solid electrolyte membrane comprises at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.
- 3. The fuel cell of claim 1, wherein said gas diffusion electrode and gas diffusion counter-electrode each comprise a blocking layer and an active layer.
- 4. The fuel cell of claim 3, wherein said active layer or said blocking layer or both comprise at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.
- 5. The fuel cell of claim 3, wherein said active layer has a thickness of less than about 10 microns.
- 6. The fuel cell of claim 3, wherein said active layer comprises at least one modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group and a metal catalyst.
- 7. The fuel cell of claim 3, wherein said active layer has no fluoropolymer binder present.
 - 8. The fuel cell of claim 1 wherein said solid electrolyte membrane comprises polytetrafluoroethylene.

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- 10. The fuel cell of claim 1, wherein said organic group is -C₆H₄SO₃.
- A method to reduce the thickness of a solid electrolyte membrane comprising forming said electrolyte membrane with a modified carbon product, wherein said modified carbon product comprises a carbon product having attached at least one organic group.
- 10 12. A method for increasing catalyst accessibility in an electrode comprising forming an active layer with a modified carbon product in the absence of a fluoropolymer binder, wherein said modified carbon product comprises a carbon product having attached at least one organic group.
 - 13. The method of claim 12, further comprising the deposition of a catalytic material on said modified carbon product.
 - 14. The fuel cell of claim 1, wherein said organic group is a proton conducting group, an electron conducting group, or both.
 - 15. The method of claim 11, wherein said organic group is a proton conducting group, an electron conducting group, or both.
- 20 16. The method of claim 12, wherein said organic group is a proton conducting group, an electron conducting group, or both.